NavMed P-369

UNITED STATES NAVY

MEDICAL NEWS LETTER

Vol. 43 Friday, 17 April 1964 No. 8

TABLE OF CONTENTS

United States Navy

MEDICAL NEWS LETTER

Vol. 43 Friday, 17 April 1964 No. 8

Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

Change of Address

Please forward changes of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland 20014, giving full name, rank, corps, and old and new addresses.

The issuance of this publication approved by the Secretary of the Navy on 28 June 1961.

SPECIAL ARTICLE

The Prediction of Disease *

By CAPT George L. Calvy MC USN, Director and Commanding Officer,
Naval Medical Field Research Laboratory, Camp Lejeune, N. C.

Introduction: Identification of the Coronary Heart Disease Candidate

The concept that an individual may be marked as a potential victim for a certain disease, due to his possession of a type specific constitution, has intrigued observant persons since the days of the ancient savants, of Hippocrates, and others. The modern era of investigation of disease proneness was ushered in with the founding of the Constitution Clinic by Dr. George Draper at Presbyterian Medical Center, New York City, in 1916.

Doctor Draper viewed the total person as one would in looking at a multipaneled Oriental screen across which was drawn a scene (1). Inspection of one panel would signify little for it would yield only a segment of the whole. Thus, assessment of body type alone would be lacking the information to be obtained from observing the person in action (physiologically and psychologically), or from probing the recesses that would contain evidence of his resistance or susceptibility to (stress) infection. The gathering of evidence from all panels would be essential to gain an appreciation of the whole.

Four divisions—or panels—for evaluating the total being were arbitrarily chosen by Doctor Draper. These were:

1. Morphology (now assessed as a somatotype)
2. Physiology — Function; Chemotype (Biochemical profile)
3. Psychology — Mental, Emotional — Patterns of response
4. Immunology — Susceptibility, Resistance — To stress (infection)

With this frame of reference and with establishment of the concept of the Unity of the Organism, the stage was set for further advance (2). During the ensuing years, more precise technics became available and during the recent advent and refinement of the computer art and science, the pace of scientific

---

* NMFR Laboratory Research Report, XIV(4):1-7, March 1964. —BUMED, Navy Dept., MR 005.09-1160.1.1.

investigation and discovery has quickened. This communication is a report of essential background and recent significant progress in the epidemiology of coronary atherosclerosis.

There is sufficient evidence available today to indicate that coronary heart disease has an incubation period just as do the well known childhood infectious diseases, measles, mumps, and others; However, in the case of coronary heart disease, the incubation period may be 10 to 20 years. It has been shown further that coronary heart disease may be detected during the incubation period in nearly all such individuals. Once detection is made, the possibility of early and effective prevention becomes a reality.

Dr. Paul Dudley White draws attention to the devastating toll that heart attacks take in this modern society and he stimulates many physicians to study methods of preventing this dreaded disease. He is a pioneer in searching for clues which he hopes will eradicate this greatest killer of them all.

I. The Coronary Profile

In 1946, Doctor White, at the Harvard Medical School and Massachusetts General Hospital, appointed Dr. Menard M. Gertler as executive officer of a project that sought to uncover clues to the identity of the coronary prone individual. Their concept of the coronary prone individual has now been validated by computer-assisted research and this story of medical progress is contained in Dr. Gertler's current book, You Can Predict Your Heart Attack and Prevent It (3). Eight pieces of information were gathered on 600 executive type workers at a major New York Corporation in 1958, put on a punched card, and fed into a computer. The computer returned 39 scores which were in the highly prone range. In less than 5 years, impressive validation of the Gertler-White concept was accomplished when 38 of the 39 persons suffered coronary heart attacks. Other leading corporations and the military (Navy-Marine Corps) are now utilizing this concept-technic to protect their high risk members. What is the meaning and application of this significant new information?

It clearly signifies the importance of preventive medicine and specific measures that will lower a man's diastolic blood pressure, his cholesterol, his uric acid, and thereby will reduce his chances of having a heart attack.

An extraordinary amount of emphasis has been placed on blood cholesterol and, of course, this one factor carries considerable weight. It should be emphasized, however, that this is only one piece of the jigsaw puzzle that comprises coronary heart disease. There is considerable evidence at hand that other intermediate chemical substances manufactured by the body may be equally culpable in precipitating an acute coronary episode.

The writer, Director and Commanding Officer of the Naval Medical Field Research Laboratory since 15 April 1959, has been identified with research projects dealing with disease prone individuals since 1942, first at Presbyterian Medical Center at the Constitution Clinic of Dr. George Draper, 1942 to 1947, with Doctors Draper, Dupertuis, and Caughey. In the Clinic

he became familiar with and interested in such disease prone types as the individual with poliomyelitis, gallbladder disease, peptic ulcer, and coronary heart disease (4). During this period, the creative mind of Dr. Draper introduced the tissue culture cell technic as a discriminant device. He was able to demonstrate individuality of the above types at the cellular level (5). This observation—one of fundamental significance—has been largely unnoticed.

Working on a parallel course at Massachusetts General Hospital, Dr. Menard M. Gertler, working in conjunction with Dr. Paul Dudley White, began their epochal study of coronary heart disease in the young adult male. Their monograph (6) was published by the Harvard University Press in 1954, and this marked a turning point in the history of the disease that was first clearly described by Dr. John B. Herrick in Chicago in 1912.

It became apparent through extensive investigation that atherosclerosis was not a necessary accompaniment of old age, but that it could occur in the unborn babe. The disease assumed new dimensions as information was adduced to identify it as a dynamic, at times reversible, metabolic dysfunction.

Just a short time before Gertler and White's publication, the classical report on healthy young American soldiers killed in action in Korea demonstrated by autopsy studies that 77.2% of this population, averaging 22 years of age, had significant coronary atherosclerosis (7). A great wave of criticism arose for it is known that the military diet contained enormous amounts of milk, butter, eggs, cheese, ice cream, and animal fats. The dairy industry felt the impact of this growing censure and strong denunciation and the consumption of dairy products declined significantly during the ensuing years. An unresolved question remained, "Was the military diet harmful?"

The author and Dr. Gertler have been associated since 1957 in cardiovascular research, first while the author was Chief of Medicine at the U. S. Naval Hospital, St. Albans, N. Y., where a 5-year study was launched in 1958 to point out discriminating factors in the individuals who were stroke susceptible versus those who were coronary susceptible.

With transfer to Naval Medical Field Research Laboratory, Camp Lejeune in 1959, opportunity arose to study the military diet and the effect of exercise on various chemical constituents of the blood serum. To everyone's surprise, cholesterol scarcely budged nor did any of the other lipids—save triglycerides—show significant change, but the answer was clear. Exercise consumes calories in the young 18-year old recruit just about as fast as he can pour them into his digestive system (8, 9).

Interpretation of a significant rise (100%+) in triglycerides awaits completion of data analysis now under way. This could well be an adaptive "feedback" mechanism in response to the demands of exercise and/or a reflection of physical fitness.

At this juncture, a series of studies on the effect of measured exercise on serum cholesterol, etc., during the taking of fat meals of saturated and unsaturated fats, has been completed. Results were presented before the American Heart Association Conference on Epidemiology of Cardiovascular Disease at Chicago, Ill., 1 February 1964. (10)

The art of forecasting disease proneness has come a long way since the early days of the Constitution Clinic in New York where the philosopher-physician and prescient scientist, the immortal Dr. George Draper, held sway. Technologic advances in science that he prophesied and the tremendous impetus derived from computer-assisted research have advanced the frontiers of knowledge.

In Draper's words, "There is no final formula, however, which can be generally applied in this matter of understanding 'the man within the patient.' But we believe that certain technical methods can be efficiently brought to the hard problem of appraising the nature of a given human being. Certain of these procedures have been set down. They have dealt with morphology, physiology, immunity, and emotion, not as isolated criteria but as coessentials in the vital whole. Like other creatures which have yielded their life secrets to biologic inquiry, so will man's be disclosed by the threefold device of observation, correlation, and interpretation (2)."

II. The Coronary Profile Score

In scoring the individual's coronary profile, eight factors are considered. Since these eight factors present fifteen million different possible combinations, it was necessary to rely on computer assistance to assign appropriate weights for each factor. The formula and derived data were contributed by Dr. Max Woodbury, Professor of Mathematics, New York University, in collaboration with Dr. Gertler and the New York University Computer Center.

Thus, scores for the following six factors were calculated and were assigned positive (+) values:

1. Family history (No history = 0; father = 14; mother alone = 20; sibling = 24, etc.)
2. Diastolic blood pressure (91 and over and age)
3. Cholesterol
4. Uric acid
5. Diabetes (Presence, duration, or absence)
6. Body build (Estimate of somatotype with reference to mesomorphy and other components)

The foregoing six factors have all yielded results showing a positive correlation with atherosclerosis. The remaining two factors correlate negatively with atherosclerosis and they are assigned negative (-) values:

7. Height
8. Phospholipids

By reference to Gertler's formula and tables, appropriate numerical values for a precise level of serum cholesterol, uric acid, diastolic blood pressure, presence or absence of family history of coronary atherosclerosis (myocardial infarction, coronary insufficiency), presence or absence of diabetes, and the degree of mesomorphy can be quickly assigned. To this sum is added a mathematical constant of 898 and the total is calculated. From this is subtracted the sum of the values of the phospholipid level of the individual and his height. Let us assume that the first six factors plus 898 yielded a score of 1500 and the two negative factors of height and phospholipids totaled 1425. The resultant score would be 75, a value that would place the individual in the high coronary prone range. On the other hand, if his negative factors totaled 1472, his resultant score would be 28, showing virtually no tendency toward his having coronary heart disease.

III. The Role of the Computer

The statistical method is used today in some phase of nearly every scientific investigation. Its value lies not only in revealing to the observer the validity of a question, but also in helping to explain the reasons for the validity. Considerable progress has been made in the prediction of weather and in the tracking of a missile. These advances would have been of lesser magnitude without computer-assisted research.

Medicine—especially the area of preventive medicine—will increasingly rely on the fruits of the computer to give it sustenance and the vigor to breach frontiers. In advancing these frontiers, we must exercise our talents and harness the computer's capability to provide us with information swiftly and accurately. No prophetic talent is required to envision further advances in the art and science of disease prediction.

NOTE: CAPT Calvy and Doctor Gertler, on invitation, held a Dialogue Seminar on A New Look at Coronary Heart Disease at Western Reserve University School of Medicine, Cleveland, Ohio, 4 February 1964. On the following day, CAPT Calvy delivered the MEND (Medical Education for National Defense) LECTURE to the WRU students in which he discussed The Parris Island-Camp Lejeune Studies in Epidemiology and in Exercise Physiology. The popularity of the newer concepts of the epidemiology and predictability of coronary heart disease is evidenced by the recent invitation for CAPT Calvy to speak on these subjects at the 8th International Congress of Internal Medicine at Buenos Aires, Argentina, 23 - 28 November 1964.

Reference (3) in the bibliography cited below is highly recommended reading for all Medical Department personnel in whatever assignment they are serving.

—Editor

Bibliography

1. Draper, G.: Human Constitution, Saunders, Philadelphia, 1924.
2. Draper, G., Dupertuis, C. W., and Caughey, J. L. Jr.: Human Constitution in Clinical Medicine, Paul B. Hoeber, Inc., New York and London, 1944.
3. Gertler, M. M.: You Can Predict Your Heart Attack and Prevent It, Random House, New York, 1963.
4. Calvy, G. L.: Concepts of Constitutional Medicine, U. S. Naval Med Bull 49:825, September - October 1949.
5. Draper, G., Ramsey, H. J., and Dupertuis, C. W.: Variation in Behavior of Buffy Coat Cultures Among Individuals of Different Constitution Types, J Clin Invest 23:864, 1944.
6. Gertler, M. M., and White, P. D.: Coronary Heart Disease in Young Adults, (The Commonwealth Fund, Cambridge, Mass.) Harvard University Press, 1954.
7. Enos, W. F., Holmes, R. H., and Beyer, J.: Coronary Disease Among U. S. Soldiers Killed in Action in Korea, J. A. M. A. 152: 1090, 1953.
8. Calvy, G. L., Cady, L. D., Mufson, M. A., Nierman, J., and Gertler, M. M.: Serum Lipids and Enzymes, J. A. M. A. 183:1-4, January 1963.
9. Calvy, G. L., Gertler, M. M., and Cady, L. D.: Serum Lipids, Enzymes, and Vigorous Exercise, Circulation 28:651, October 1963, Part 2.
10. Calvy, G. L., Coffin, L. H., Gertler, M. M., and Cady, L. D.: Serum Lipids, Vigorous Exercise and High Fat Diet, Clinical Research XII, April 1964, No. 2.

* * * * * *

Aviation Physiology - An Early Application *

By Surgeon Commander S. J. Lloyd R. A. N., Editor of the Royal Australian Navy Medical Newsletter. From Vol. 1, No. 2, 19-23 of that publication, June 1963.

It is ten years since men first climbed the highest mountain in the world, and now teams from at least three nations have scaled that peak. Although it may never be known whether Mallory or Irvine achieved their objective before the final tragedy, certainly Hillary and Tensing were not the first to look down on the summit of Everest; thirty years ago, almost to the day, two British aircraft flew over the summit, setting a landmark not only in human achievement, but also in the practical application of aviation physiology.

In 1933, an operational flight at an altitude of 34,000 feet represented the ultimate both in aircraft and engine performance and in physiologic protection of crew. The Everest flight was not in itself an altitude record

(An American had reached 43,000 feet in 1930), but it was a convincing test of aircraft and equipment under operational conditions, involving, as it did, an extended flight over hazardous terrain for a practical purpose—an aerial photographic survey. The key to success was the use of oxygen, as has been the case in every successful climb on foot; Priestley and Lavoisier can justly claim a place in the conquest of Everest.

Planning began in March 1932, the initiating stimulus being the development of the Bristol Pegasus engine, the first British aero-engine whose performance showed promise of being equal to the task. The expedition was organized privately by a committee under the patronage of Lady Houston D.B.E., who financed the enterprise; unofficial support was given by the Royal Geographical Society, the Air Ministry, and the Government of India. The aircraft selected to be fitted with the Pegasus engine were a Westland Wallace and a Westland PV3, both being two-seater biplanes with an open cockpit for the pilot and a closed, but not pressurized, cockpit for the observer. There were many, many engineering problems to be solved in relation to the engines, airframes, and photographic equipment; physiologic requirements were the provision of oxygen and maintenance of body temperature. Decompression sickness was a possibility at the intended altitude, but the "G" factor did not enter into consideration as the maximum speed was 135 m.p.h., and no aerobatics were anticipated.

At this time, the science of aviation physiology was in advance, not only of aircraft performance, but also of the technics available for its practical application. The oxygen equipment in particular had to be specially developed for the flight, and much improvisation was necessary. The Royal Aircraft Establishment at Farnborough already had a decompression chamber in which the aircrews and their equipment were tested to a simulated altitude of 37,500 feet; flight tests to the same altitude were carried out in England before departure of the expedition to India.

Oxygen requirements on the Everest flight were considerably greater than on previous high altitude test flights, as the distance from Purnea to the summit was 160 miles, most of which would have to be flown at altitude; it was necessary for political reasons to cross the Nepalese frontier (45 miles from Purnea) at 12,000 to 15,000 feet, and the rest of the flight was a steady climb to 33,000 or 34,000 feet over Everest, involving more than two hours at a high oxygen consumption rate. A simple continuous-flow system was used, with no demand-valves or economizers, and it was decided to use oxygen from take-off; varying the flow rate with altitude so as to reach as near to 100% inspired oxygen per minute per man was necessary to achieve this. In order to provide sufficient reserve capacity for emergencies, a total of 3000 litres was carried in four 750 litre alloy steel cylinders in each aircraft. The cylinder pressure of 120 atmospheres was reduced by a manually operated regulator valve to give the required flow rate at ambient pressure, the gas then passing through an electrical heating coil to the flow meter, graduated in tens of thousands of feet altitude; the flow rate was adjusted by the user in 5000 feet steps to give a flow-meter indication of the next 5000 feet

above the altimeter reading. This simple system of control proved quite satisfactory in practice and remained in use, with minor modifications, until the Second World War.

The oxygen control equipment, mounted in each cockpit, was connected to the user's mask through a flexible metallic tube and quick-acting bayonet joint. In the observer's case, this flexible tube was 9 feet long to allow a sufficient range of movement while handling the various cameras used for the photographic survey and record purposes;this led to an accident on one of the flights when the tube was broken by being trodden on, luckily without ill effect.

The face masks worn by the aircrews were the weak link in the system; a fiber mask was the standard pattern at that time; it was both clumsy and inefficient. Only later in the expedition was an experimental rubber mask available which proved much more convenient. The fiber mask, containing the microphone of the intercommunication system, projected too far in front of the face and interfered with sighting the cameras which had to be fitted with special viewfinders in consequence. It was attached by metal springs extending around to the back of the flying helmet and was distinctly uncomfortable; it was not intended to be gas-tight and, indeed, had two holes to allow dilution of inhaled oxygen by air at the lower altitudes; these holes had to be plugged with corks above 30,000 feet. The inefficiency of this type of mask was recognized and it was accepted that some degree of hypoxia would be inevitable above 33,000 feet. The use of positive-pressure breathing was not considered because of the technical difficulties involved, but the possibility of intravenous or intramuscular injection of oxygen was raised in preliminary discussion; understandably enough, these imaginative technics were also dismissed from serious consideration.

Environmental temperature was maintained by electrically heated clothing. Cockpit heating was out of the question because of the open nature of the cockpits; although the observer's cockpit was enclosed by a canopy during most of the flight, it was necessary at frequent intervals to take oblique photographs and cinema film over the side of the cockpit. In addition, during special flights made for infra-red photography, the observer had to hang head downward through a trapdoor in the floor of his cockpit to get a special long-focus infra-red camera slung beneath the aircraft. The one-piece flying suits, boots, and gloves were all electrically heated and interconnected by cables. Flying goggles were also heated to prevent frosting up. Power for the clothing, as well as the oxygen heating coils and the electrically heated cameras, was obtained from a one-kilowatt generator directly driven by the engine, the voltage being manually controlled by the observer. These heating arrangements proved satisfactory in the ambient temperatures encountered, 45 degrees below zero Centigrade over the summit; more trouble was given by the camera heating devices than by the flying clothing.

Decompression sickness was not evident in any of the high-altitude flights, nor was any expected, all aircrew members having passed a test run in the decompression chamber at Farnborough to more than the operational altitude. Safety harness and parachutes were not carried on the actual flights

over the Himalayas, as survival would have been impossible in the event of a crash-landing or bale-out over the mountains, and the weight penalty involved might have made all the difference between success and failure.

After just on a year of preparation in England, the expedition arrived in India in March, 1933, and the first flight over Everest was made on April 3rd of that year. The first aircraft was piloted by S/Ldr. the Marquess of Clydesdale, with Col. S. V. S. Blacker, (the originator of the project), as observer. The second machine was piloted by F/Lt. D. F. McIntyre, with S. R. Bonnett, of the Gaumont-British Picture Corporation, as observer. All went well on the first part of the flight, except that the dust haze, invariably present over the plains of Northern India to a height of 5 - or 6,000 feet, on this occasion extended to 19,000 feet and interfered with the start of the photographic survey. At the final altitude of 31,000 feet, the observers, who had to expend a good deal of energy manipulating the heavy cameras and moving round the cockpits in a tangle of electric cables and oxygen hoses, suffered mild hypoxia due to the inefficiency of their oxygen masks; it was necessary to plug the air holes in the sides of the mask with previously prepared corks, and to hold the mask tightly to the face. Just before reaching the summit of Everest both aircraft came suddenly into a powerful down-current caused by deflection of the Westerly wind over the summit, and lost 1,500 feet altitude in a few seconds; they eventually cleared the summit with no more than 500 feet to spare. They passed at one point through the "plume" of Everest, hitherto thought to be only cloud but now discovered to be a mass of snow and ice fragments and crystals, picked up in the vortex to leeward of the crest; some damage was done to the plastic windows of the observers' cockpits by the flying debris. The return flight was made without incident.

Kanchenjunga was the objective of the next day's flight, which was made with a change of crews, the pilots on this occasion being Air Cdre. P. M. Fellowes and F/O R. C. Ellison, neither of whom had flown the aircraft previously. Throughout this flight Fellowes had trouble with his oxygen mask, which tended to come adrift and had to be held on by hand. Although he retained control of the machine, the resulting hypoxia interfered with his map-reading ability and he lost his way back, and had to make a forced landing on reaching the plains. Ultimately the aircraft was flown back to Purnea, after extra fuel had been ferried to it in one of the light planes attached to the expedition. It was during this flight that the only occasion of 'G' stress occurred; near the summit of Kanchenjunga, severe turbulence was encountered, and 2.8 G was registered on a recording accelerometer.

The second Everest flight was made on April 19th, with the same crews as on the first flight. This time oxygen was not brought into use until 18,000 feet was reached, greatly reducing the quantity required, without introducing any ill effects. This flight was quite uneventful, the down-draft near the summit being avoided now that its presence was known, although winds of up to 120 m. p. h. were experienced. This was the last flight.

The achievements of the expedition may not seem impressive in an age

when commercial passenger flights are regularly made at even higher altitudes, military reconnaisance at 70,000 or 80,000 feet is commonplace, and manned orbital satellites have made airbourne altitude records meaningless. Nevertheless, they were signposts on the road to present high altitude techniques, and marked a period in Man's eternal struggle to conquer natural obstacles; it was to be another twenty years and two months before human footsteps briefly disturbed, for the first time, the virgin snow of the highest point on Earth.*(Republished by permission of the Medical Director – General, R. A. N., Surgeon Rear Admiral L. Lookwood and the Royal Australian Naval Board.)

False-Positive Serology in Mononucleosis

Col Robert J. Hoagland,* MC, USA, FACP, Honolulu, JAMA, 185(10):783-785, Sept. 7, 1963.

MISCONCEPTIONS of infectious mononucleosis have arisen from uncritical repetitions of statements by earlier writers. The dictum of the frequent occurrence in mononucleosis of biological false-positive serologic reactions for syphilis (hereafter referred to as BFP) has been long accepted and unquestioned. In a recently published article, it was stated that infectious mononucleosis was among the diseases which provoke a "high incidence" of BFP. The wide range of reported incidence is remarkable——one claiming that BFP's have occurred in "from 2 to more than 60 per cent of cases." Recent articles have reported an incidence of 20%.

After observing many patients with mononucleosis without finding any BFP, the author undertook to ascertain its frequency in a series of 300 consecutive personally examined patients. Except for exclusion of outpatients, cases were unselected. This paper is a report of his results and conclusions.

Method

The incidence of BFP in infectious mononucleosis was ascertained by studying cases which met all three requirements for diagnosis (clinical, hematological and serologic). Hence, the conclusions are not vitiated by being based on questionable diagnoses. Hematological requirements for the diagnosis of mononucleosis can be summarized as: (1) lymphocytosis of at least 51% (it was over 75% in half the cases) lasting at least 10 days, and (2) presence of atypical lymphocytes. The serologic prerequisite for diagnosis was a heterophile antibody titer of at least 1:14 after absorption with guinea pig kidney. (In almost all cases the titer after such absorption was at least 1:28). Titers after absorption with beef erythrocytes were almost always zero. In a few cases there was a low antibody titer after beef erythrocyte absorption, but

* Chief, Department of Medicine, US Army Tripler General Hospital.

this titer was always exceeded by the titer after guinea pig kidney absorption.

Cardiolipin microflocculation tests were obtained on sera of all hospitalized patients; and whenever a result was reactive, a cardiolipin complement fixation test was performed. A rapid slide test (a cardiolipin microflocculation procedure yielding qualitative results) was used as a screening procedure. Whenever any reaction was observed, serum was serially diluted and subjected to a carefully standardized quantitative cardiolipin microflocculation test. The technique described in an Army Technical Manual on laboratory procedures in clinical serology[1] was adhered to in every detail. The antigen and antigen diluent used were made by the Walter Reed Army Institute of Research. The antigen is composed of cardiolipids and lecithin extracted from beef heart and purified. Cholesterol is added to the alcoholic mixture of cardiolipids and lecithin to increase the antigen's effective reacting surface.

Results

Cardiolipin microflocculation tests were performed on sera of 300 consecutive inpatients with confirmed mononucleosis; only three patients' sera gave reactive results. One of the three patients had concurrent syphilis, and two had BFP. Therefore, the incidence of BFP in infectious mononucleosis is 0.66%—at least under usual circumstances (ie, when serology for syphilis is ordered only once).

Almost all (92%) of the patients in this series were 18- to 25-years-old. Only three patients were under 15 years of age and only one was over 30 years. All but 27 patients were male; of these 268 were in the military service and 5 were students. Seven of the females were military personnel and twenty were civilian dependents.

The first instance of BFP did not occur until the 85th case of mononucleosis was studied. A cardiolipin flocculation test in this case, done on the 16th day of illness, was reactive; and the complement fixation test was positive in a 1:4 dilution. On the 28th day after onset of illness the cardiolipin flocculation test was nonreactive.

The next mononucleosis patient with serologic reactions of syphilis was encountered 6 years after beginning this investigation. Skeptical of the frequent occurrence of BFP in mononucleosis, the author ordered a Treponema pallidum immobilization test. The positive result, and persistence of reactive results of cardiolipin tests, revealed that the patient had infectious mononucleosis and concurrent syphilis.

The second, and last, instance of BFP was found during the study of a 23-year-old man whose first cardiolipin microflocculation test, done 22 days after the onset of mononucleosis, was reported as being reactive (with 0 titer); the complement fixation test was reactive. The cardiolipin micro-

1. Laboratory Procedures in Clinical Serology, TM 8-227-1, Washington, D.C., US Dept of Army, Oct, 1960.

flocculation test on the 25th day after onset gave the same result, but the complement fixation test was now nonreactive; and 31 days after onset, cardiolipin microflocculation, Treponema pallidum, and Reiter protein complement fixation tests were nonreactive.

About half (52%) of the cardiolipin tests were performed during the second week of illness, and 73% were performed during the second or third week of illness; 25% were done during the first week (between the fourth and seventh days), and 2% were done during the fourth or fifth weeks. Since routine serologic tests are ordinarily requested only once (with repetitions for specific reasons), the results obtained in this study reflect the incidence of BFP under ordinary conditions.

Comment

The results of the writer's study diverged so greatly from the generally accepted incidence of BFP in mononucleosis—20% according to the often-quoted figures of Moore and Mohr as well as more recently published articles —that older pertinent reports were reviewed.

Some were unreliable because they antedated the introduction of the heterophile antibody test, an indispensable requirement for diagnosis. Two frequently cited articles turned out to be reports of single cases. The validity of all of the older articles available to the author was impaired either by omission of heterophile antibody tests or, if such tests were done, by omission of guinea pig kidney absorption in performance of these tests. Diagnoses of mononucleosis were sometimes rendered questionable or improbable because of hematological features or insignificant titer of heterophile antibody reactions (unabsorbed)—eg, titers as low as 1:7 and 1:14.

Few large series of unselected cases of mononucleosis have been reported. The largest series reported were those of Kaufman, Bernstein, and Wechsler and associates, Kaufman reported three instances of BFP in 64 cases, but gave details of only three patients; the author believes two of these probably did not have mononucleosis. Kaufman did not state the hematological and heterophile antibody prerequisites for inclusion in his series. Bernstein reported an incidence of 18% BFP in a series of 44 patients. He included questionable instances of mononucleosis, since characteristic heterophile antibody reactions were not required for the diagnosis of mononucleosis.

Wechsler and associates reported on an epidemic of what they considered to be mononucleosis in an army camp in 1943 and 1944. They concluded that the incidence of BFP, in 263 patients who had Kahn tests, was 3%. However, this often-quoted paper sheds no light on mononucleosis because lymphocytosis and characteristic heterophile antibody reactions were not requisites for diagnosis. About two-thirds of their cases (68%) had maximal "mononuclear percentage" of less than 50%! The only requirement for diagnosis of infectious mononucleosis was the presence of at least 10% abnormal lymphocytes in differential leukocyte counts.

A report by Kolmer and associates gave one clue as to why the figure of 20% was so often cited as the incidence of BFP in mononucleosis. These authors collected 13 articles dealing with positive Wassermann reactions in mononucleosis. Three of the articles were merely reports of isolated, ie, single, cases; and two of the articles concerned cases selected solely because they were deemed unusual (and in the author's opinion unlikely) cases of mononucleosis. The authors then, despite the obvious fallacy of selectivity, added the number of cases contained in the 13 articles and the number of positive Wasserman reactions. They stated that in the total of 191 cases, 40 (20.9%) showed positive Wassermann reactions. The statistical validity of this contribution is open to question.

These comments indicate that inadequate criteria for diagnoses of mononucleosis and excessive significance attributed to isolated case reports explain the higher rate of BFP in other studies of mononucleosis. In addition, it is likely that use of the cardiolipin rather than the Wassermann and Kahn tests partially accounts for the much lower incidence of BFP in the present series.

Summary and Conclusions

There is no sound basis for the long held belief that biological false-positive serologic tests for syphilis (BFP) are often encountered in mononucleosis. It is time to expunge this error from the lore of infectious mononucleosis. The incidence of BFP is about 0.66%.

A reactive serologic test for syphilis in a mononucleosis patient should raise the question of concurrent mononucleosis and syphilis.

NOTE: Colonel Hoagland, in this well-controlled study, has made a noteworthy contribution which is of special significance to military medicine. Hospital admissions for infectious mononucleosis among Navy and Marine Corps patients varied from 1,375 to 2,029 per year from 1952 through 1961.

—Editor

* * * * * *

Rural Health in Africa

At a seminar held by the WHO Regional Office for Africa in Enugu, Eastern Nigeria, from 19 to 23 November 1963, physicians, nurses, sanitarians, and others responsible for the planning and execution of rural health programmes in Africa exchanged views and made suggestions on future work and policy.

The topics of discussion included: co-ordination between the activities of rural health services and those of national health services and of government services responsible for specific disease control programmes; technical, financial, and organizational problems; and the preparation and selection of staff.

MISCELLANY

LCDR Wells Receives Science Honor

LCDR William H. Wells, Medical Service Corps parasitologist on the staff of Oakland Naval Hospital's Preventive Medicine Technician Course, has the distinction of having a new species of parasite named for him.

Haplorchis wellsi, which is found as an intestinal trematode of fish-eating birds and mammals and possibly as an accidental parasite of man, has been recently described by Dr. J. C. Pearson of the University of Queensland, Brisbane, Australia.

Specimens of the new parasite were discovered by LCDR Wells while he was conducting a survey of the parasites of man and lower animals in the high mountains of central Taiwan in 1962. Mr. Wells sent specimens to Dr. Pearson, a world authority on the parasites of animals, who, after deciding that it definitely was a new species, named it for Mr. Wells. A description of the parasite is included in a paper soon to appear in the British journal, Parasitology.

This is not the first new species of parasite discovered by the MSC officer. While working in eastern Turkey along the Russian border in 1954 and again while conducting surveys in the Egyptian and Libyan deserts in 1953-55, he recorded several new parasites and new host records. A recent paper published in the Annales de Parasitologie (Paris) is based on material collected by Mr. Wells in Egypt, Libya, and along the Red Sea coast in northeastern Sudan.

—Submitted by Rear Admiral C. L. Andrews, MC, USN,
Commanding Officer, USNH, Oakland, California.

* * * * * *

Twelfth Annual Clinical Meeting of the American College of Obstetricians and Gynecologists

The Twelfth Annual Clinical Meeting of the American College of Obstetricians and Gynecologists will be held at the Americana Hotel, Bal Harbor, Miami, Florida, 17 to 22 May 1964.

It is anticipated that round trip government air transportation will be

available for nominees stationed at East Coast Activities who are attending the meeting. This flight is scheduled to depart from the U. S. Naval Air Facility, Andrews Air Force Base, Washington, D. C., at 0800 on the day preceding the meeting, making stops at Norfolk, Virginia, Charleston, South Carolina and Jacksonville, Florida and will return to Washington, D. C. on 23 May 1964.

Medical officers desiring seat reservations on the airlift should submit their requests immediately to BuMed, Code 31. Preference will be given to those being inducted into the College.

—Professional Division, BUMED

* * * * * *

USNH, Yokosuka, to Host Fourth Annual Session, Far East Region of the American College of Physicians

YOKOSUKA, JAPAN (CNFJ) March 19 -- "Puzzles and Problems in Medicine" is the theme for the Fourth Annual Session, Far East Region of the American College of Physicians to be held at the U. S. Naval Hospital here May 18 to 20.

More than 300 physicians, consisting of medical authorities from the United States, the Far East Armed Forces, national consultants, and distinguished Japanese physicians, will participate in the conference to exchange scientific medical information.

The Honorable Edwin O. Reishauer, United States Ambassador to Japan, whose address to the Third Annual Session at Camp Zama, Japan was a highlight of that meeting, will also address the new session.

General Chairman of the session, Capt. G. M. Davis, MC, USN, stated that the Far East Session would result in the exchange of scientific information that will lead to more enlightened patient care and higher standards of medical practice in the Armed Forces.

The Far East Region of the American College of Physicians was organized in 1961 to stimulate interest in the college, afford the opportunity for Fellows, Masters and prospective college members to attend a professional college meeting, and promote better international relationships through the medium of medicine.

College President, Wesley W. Spink, MD, FACP, who will also attend the meeting, gave warm approval and encouragement to continue the annual regional sessions.

The Yokosuka Naval Hospital is located at U. S. Fleet Activities, Yokosuka, Japan, thirty miles south of Tokyo. The base is readily available from ships docking in Yokohama or Yokosuka, and aircraft landing at Yokota, Tachikawa Air Force Base, Atsugi Naval Air Station or Tokyo International Airport.

—From P. I. O., Commander,
U. S. Naval Forces, Japan

Surgeon General Praises HM1 Ehrgott for Rendering Life-Saving First Aid

On 5 March 1964, Rear Admiral Edward C. Kenney, MC, USN, Surgeon General of the Navy, sent the following letter to HM1 Elwood D. Ehrgott, Jr., USN, USS UMPQUA (ATA-209), FPO, New York, New York:

> "It has been brought to my attention that on 31 January 1964, you initiated emergency first aid which was instrumental in saving the life of a new Seaman watchstander aboard the USS UMPQUA (ATA-209).
>
> While making a check on the new Seaman watchstander you found him hanging by his binocular straps from the flying bridge voice tube. The Seaman was standing lookout on the flying bridge and had lost consciousness. As he slumped to the deck he apparently caught his binocular straps on the ship's voice tube causing strangulation. You immediately placed the man in shock position and administered mouth-to-mouth resuscitation. You then administered oxygen by a mechanical resuscitator. When breathing was restored and the Seaman showed improvement you supervised his transfer below decks where further examination indicated the need for further help. He was then moved to the fantail where he was air evacuated by helicopter.
>
> This action exhibits your outstanding qualities and high degree of professional competence which are in keeping with the highest tradition of the Hospital Corps of the U. S. Navy.
>
> It gives me a great feeling of satisfaction as Surgeon General of the Navy to know that hospital corpsmen like yourself are upholding the tradition of selfless and efficient service which the Hospital Corps has enjoyed since its inception.
>
> I extend my personal congratulations for a job well done and wish you continuing success in your Navy career as a hospital corpsman."

* * * * * *

New Booklet Explains Prevention of Foodborne Illness

Food poisoning affecting an estimated one million persons in the United States each year is the subject of a new Public Health Service booklet called "You Can Prevent Foodborne Illness."

The booklet points out how foodborne illness can be prevented and lists

the five principal causes of such outbreaks: disease-producing bacteria, poisons produced by bacterial action, disease-producing parasites, poisonous chemicals or poisonous plants.

It is explained that the great majority of food poisoning cases—those due to the presence in food of harmful bacteria or bacterial toxins—can be avoided through the use of precautions in the handling of food, and by "holding" foods at temperatures which inhibit bacterial growth.

Some specific and typical foodborne disease case studies of actual investigations are included to show how careless or improper handling of food may trigger such incidents.

Single free copies of the publication are available from the Public Health Service Division of Environmental Engineering and Food Protection, or the Public Inquiries Branch, Public Health Service, Washington 25, D. C. The booklet is for sale through the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at five cents per copy; $2.50 per 100.

* * * * * *

Federal District Court Upholds Authority of Public Health Service to Isolate International Traveler Suspected of Being Smallpox Carrier

"A Federal District Court (last fall) upheld the authority of the Public Health Service to place in isolation an international traveler suspected of being a smallpox carrier. It was the first such legal case in the Service's history.

"The traveler was a 69-year-old American woman who arrived in New York by air from Stockholm, Sweden, which was in the midst of a smallpox outbreak. She was placed in isolation at the Public Health Service Hospital in Staten Island, New York, because she did not have a valid international certificate of vaccination and because, by her own admission, she had not been successfully vaccinated since childhood. (She was vaccinated by a Public Health Service officer at time of arrival and subsequently developed a "good take," which showed that her level of immunity had been low.)

"Shortly after the woman was placed in isolation, her lawyer filed a petition for her release in the U. S. District Court for the Eastern District of New York. The petition was denied. The court concluded:

> That the three physicians who had testified shared a concern that was evident, real, and reasoned.
>
> That they could not ignore the fact that the woman might have been exposed in Stockholm.
>
> That "no one on earth" could know for 14 days whether or not she had been exposed.
>
> That the person with a history of unsuccessful vaccination was peculiarly in a position to have become infected and to infect others.

That isolation did not discriminate against her or single her out for treatment different from that given others similarly situated. (The woman was one of 17 American citizens and foreign visitors who arrived from Stockholm under similar circumstances over a 2-month period and were placed in isolation. Fortunately none of them came down with smallpox.)

"This case holds an important lesson for all of us who are concerned with the health of international travelers and with the facilitation of international travel. The lesson is this: Persons planning trips abroad should be alerted that many countries, including the United States, require arrivals to present a validated international certificate of vaccination against smallpox within the previous 3 years. This and other health requirements, as well as recommendations, for international travel are spelled out in a series of five leaflets and a booklet issued by the Division of Foreign Quarantine. We would be glad to send you single free copies on request.

"The leaflets (one general and one each for travel in Europe, in Asia, in Africa, and in Latin America) are for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 5 cents apiece or $3.75 per 100 copies. The booklet, entitled "Immunization Information for International Travel, 1963-64," sells for 35 cents, with a 25 percent discount on orders of 100 copies or more delivered to the same address."

—From: Harold Wolfe, P.I.O., Division of Foreign Quarantine, PHS, DHEW.

* * * * * *

FROM THE NOTE BOOK

LT R. F. Holcomb, Jr., MC, USN and Dean R. Holmes, Hospital Corpsman Second Class, USN, received the Navy Commendation Medal from the Secretary of the Navy on 5 March 1964 for service set forth in identical CITATIONS which read as follows:

"For meritorious performance of duty on 10 and 11 March 1963 while serving with a United States Marine Corps rescue team which succeeded in locating and rescuing the injured pilot of a crashed Army aircraft near Mang Buk, Republic of Vietnam. Participating in the two-day search which led through dense jungle and an area in which there was enemy Viet Cong activity, Lt Holcomb/Holmes, by their perseverance and fortitude, contributed materially to the success of this hazardous mission. Their selfless and inspiring devotion to duty in the face of extremely adverse circumstances was in keeping with the highest traditions of the United States Naval Service."

S/ Paul H. Nitze

Secretary of the Navy

Shark Shocker is Sure-Fire Saver

New York (AFPS Week of March 29, 1964)—Astronauts, pilots and frogmen who find themselves in shark-infested waters may soon be equipped with a new weapon to ward off the finny killers of the sea.

The Armed Forces and the National Aeronautics and Space Agency (NASA) have expressed keen interest in an invention known as the Hicks Electronic Shark Repeller, cited as the first effective shark repellent. The Coast Guard is considering using the units in air-sea rescue work. NASA would like to attach a miniature version of the unit to their astronauts' suits.

Invented by John Hicks, a 37-year-old zoology graduate of the University of Miami, the repeller operates on batteries in a waterproof casing from which extend two miniature antennas. Electronic impulses are beamed on the shark's nervous system, and the shock waves emitted by the antennas are enough to send the shark thrashing wildly off.

The repeller is effective up to 75 feet in all directions. The bigger the shark, the greater the deterrent effect, because of its larger and more highly sensitive nerve network.

"This (device) won't kill the shark," Hicks said. "We don't want to do that. It just repels them." Although the jolt received by the sharks is not fatal, the scare lasts a long time.

* * * * * *

Hospital Corpsman Green Honored by CO of Ship

On board USS SIOUX in the North Pacific - Jerry F. Green, hospital corpsman first class, USN, Medical Representative of the fleet tug USS SIOUX, received a coveted letter of commendation during shipboard ceremonies March 7 at Adak, Alaska. The commendation award was made while Green's shipmates were assembled for Commanding Officer's personnel inspection.

The letter of commendation, which will become a permanent part of Green's service record, states:

"As Medical Representative of this command, you are responsible for administering to the health of the crew, maintaining all appropriate medical and dental records, and keeping the Commanding Officer informed as to sanitation and pest control. An equally vital collateral duty of the Medical Representative is the training of the crew in all facets of first aid and personal hygiene.

"You are hereby commended for your outstanding performance of duty, as evidenced by the laudable results of medical inspections conducted by Commander Fleet Training Group, San Diego, and the Staff of Commander Service Squadron ONE. Both inspections indicated that you have expended maximum effort in organizing the medical activities of this command and that your medical training program has been particularly effective."

DENTAL SECTION

The Pulpal Pocket Approach: Retrograde Periodontitis

Marvin Simring B A D D S and Maurice Goldberg B A D D S, New York University College of Dentistry, J Periodont 35(1): 22-48, January 1964. *

It is the aim of this paper to relate the signs and symptoms of one common etiologic factor, whose correction may retrieve from consignment to extraction many teeth whose advanced periodontal disease formerly rendered their prognosis negative or even "hopeless." This common factor is disease of the pulp.

Pulpal disease can be involved in the causation of periodontal disease, contribution to periodontal disease, and the prevention of healing of periodontal disease when marginal irritational, dysfunctional, and metabolic etiologic factors have been corrected.

Pulpal disease, as a source of materials toxic or pathogenic to the periodontium, may create a tissue-destructive process which proceeds from the apical region toward the gingival margin. This may be termed retrograde periodontitis in order to differentiate the process from marginal periodontitis in which the disease proceeds physically from the gingival margin (the site of etiologic irritation) toward the root apex. Of course, the two processes generally exist side-by-side and may have the same signs and symptoms. Therefore, they are difficult to distinguish.

Retrograde periodontitis may be evidenced by mobility, pocket formation, gingival suppuration, gingival inflammation and alveolar bone loss. The original cause of the pulpal pathosis does not appear to be significant in the development of the retrograde periodontitis. The pulp may be affected by caries, mechanical exposure, acute trauma, chronic occlusal trauma, or retrograde pulpitis which stemmed from prior marginal periodontitis. Once pulpal pathology becomes established it may serve as a reservoir for retrograde periodontitis because of the poor resistive and recuperative powers of the dental pulp.

The acute material which spreads from the pulp to the periodontium and which causes the symptoms of retrograde periodontitis may include: (1) microorganisms, (2) toxins, whose origin may be either microorganisms or tissue degradation.

In effect, the concept of retrograde periodontitis implies that the root canal may become an extension of the periodontal pocket. Thus elimination of

the periodontal pocket (by whatever method chosen) would involve elimination of contributing pulpal disease when this had reached an irreversible status.

An investigation was performed which revealed that endodontic therapy is indicated in the treatment of terminal cases of periodontal disease which have not responded to expert periodontal therapy. This combined pulpoperiodontal therapy was based upon the rationale that these cases resisted expert periodontal therapy because they were affected by a retrograde periodontitis. Twenty-five cases illustrated various clinical applications and ramifications of this concept.

It must be stressed that endodontic therapy has not been shown to prevent periodontal disease. If anything, it may actually pre-dispose toward hastening its progress. Furthermore, endodontic treatment does not cure periodontal disease. Only in a small number of terminal periodontal lesions will it permit the usual periodontal procedures to be successful. *(Submitted by CDR Perry C. Alexander DC USN, U.S. Naval Dental Clinic, Long Beach, Calif.)

* * * * * *

Citric Acid Metabolism in Periodontosis

A. Tsunemitsu, K. Honjo, M. Kani, and T. Matsumura. Dept. of Oral Hygiene, Osaka Univ Dental School, Japan. Arch Oral Biol 9(1): 83-86, January-February 1964.

The results of this study show that the citric acid content of blood from periodontosis subjects was higher, and that the amount of citric acid excreted in urine during 2 hours after intravenous administration of sodium citrate was significantly increased in comparison with that of normal controls. Therefore, it may be suggested that disturbed metabolism of citric acid exists in many patients with periodontosis.

Because of the many possible sources of citric acid, it is difficult to interpret the true meaning of the results obtained. If, as reported by Becks and Ratcliff (1955), the blood pantothenic acid is low in periodontosis cases, then one would expect decreased citric acid providing the pantothenic acid level was such as to form inadequate CoA·SH. The results indicate increased citric acid values in periodontosis cases. This might be explained by the increased acetylating activity which has been indicated by Hue, Burrill and Fosdick (1961).

Many factors—namely, vitamins C and D, insulin, parathyroid and adrenal cortical hormone with liver and kidney function—are related to the formation and destruction of citric acid; further research is necessary to investigate the complicated mechanism of disturbed metabolism of citric acid in periodontosis subjects.

* * * * * *

Auscultation of Masticatory Mechanism: Use of the Stethoscope in Dentistry*

D. M. Watt, School of Dental Surgery, University of Edinburgh, Scotland. D Practitioner 14: 27-30, September 1963. From Dental Abstracts 9(2): 107-108, February 1964.

Auscultation of the masticatory mechanism by a stethoscope can provide the dentist with additional information on the occlusion of the teeth and the function of temporomandibular joints.

For clinical work a stethoscope with a simple chest piece is used. If the sounds are to be recorded on tape, or visualized and photographed as an oscilloscopic tracing, a hearing aid earpiece is fitted into the stethoscope chest piece, and used as a microphone. The oscilloscopic technic is particularly valuable in following the progress of patients being treated for temporomandibular joint disorders. Each change in the occlusion results in a change in the oscilloscope tracing. As the function of the temporomandibular joints improves, changes in the joint sounds can be heard and recorded.

The stethoscope positions for auscultation of the masticatory mechanisms are: supra-orbital, infra-orbital and buccal. These positions are used for listening to the sounds produced by occlusion of the teeth. The masseteric position is used for sounds within the temporomandibular joint.

To record occlusal sounds, the patient is asked to click his teeth together gently in the position of occlusion which is being investigated. The sounds produced by the occlusion of complete dentures differ from those of natural teeth. Acrylic teeth produce a sound which has a lower frequency and is softer than that produced by porcelain teeth. Occlusal sounds from all complete dentures contain a hollow note which is more evident where the fit of the denture bases is poor.

To listen to sounds within the temporomandibular joint, the stethoscope is applied 2 cm below and in front of the joint over the masseter muscle. Crepitus creates a stethoscopic sound like that of a footstep in gravel; this sound is almost diagnostic of temporomandibular joint arthrosis. The stethoscope always should be applied to both sides of the face, since hard crepitus on the left side may sound as a soft crepitus when the stethoscope is applied to the right side.

The dentist must learn to distinguish between the clicking noises in the temporomandibular joint which may indicate pathosis and those clicking sounds which are found in symptomless joints.

---

* * * * * *

Radiation and Image Distortion in the Panorex X-Ray Unit

Owen W. Kite D M D, Lennard T. Swanson D M D, Samuel Levin, and Edna Bradbury R D H.* Oral Surg, Oral Med and Oral Path 15(10): 1201-1210, October 1962.

There are no official recommended maximum permissible values for exposure of a patient to radiation. Current thinking on the matter is that diagnostic x-ray machines should be used by qualified medical and dental personnel, that the need for the desired information should outweigh the potential harmful effects of the radiation, and that for each x-ray examination the patient should receive the minimum possible exposure. Technical improvements in equipment and film emulsions have been introduced in recent years, so that now dental radiographs of good diagnostic quality can be produced at a fraction of the x-radiation exposure required previously. For example, in 1955 skin doses ranging up to 184 r were reported for typical full-mouth dental x-ray examinations. Of considerable importance is the fact that the dose to the gonads per full-mouth examination can be reduced to less than 1 mr.

The full-mouth dose for the Panorex unit approximates 9 r (with 1 mm external filtration) and therefore is consistent with presently accepted good techniques with respect to minimizing exposure of the patient. This is made possible by the intensifying screen which reduces the needed exposure by a factor of 25 and by the use of fast film. For the Panorex unit the calculated dose to gonadal region approximates 2 mr per film, which is also an acceptable low value for a full-mouth examination.

Measurements of scatter and leakage radiation at the operator's position revealed dose rates ranging from 0.5 to 10 mr per hour for the two Panorex units tested. These measurements, plus film badge results, clearly established that exposure of the technician was well within permissible limits during a one-month test period in which 800 Panorex film examinations were made.

It is concluded that the Panorex unit provides a means of obtaining full-mouth dental radiographs with desirably low x-ray exposure to patient and technician.

Since the Panorex is not in widespread use and represents a relatively new dental technique, a few words on the impressions of its use may be in order. The unit is just about as easy to use as any ordinary dental x-ray machine, once the proper positioning of the subject is mastered. Pressing of the timer button automatically initiates the rotation of the film and tube-head arm and the movement of the chair in the middle of the excursion. Positioning of the arm holding the tube head and cassette holder was cumbersome, and fine adjustments were difficult, but the manufacturer has recognized his problem and has incorporated a motor drive to raise and lower the unit.

---

* Massachusetts Institute of Technology and Children's Hospital Medical Center.

The metal cassettes holding the 5 by 12 inch film are bulky and expensive. The cassette holder itself could be reduced in size. There would then be greater opportunity to include the entire lower border of the mandible on all subjects. With the present arrangement, a heavy-shouldered person can prevent rotation of the film or has to compensate by stretching his neck so that he is in a strained and unnatural position and hence is more likely to make involuntary movements during the exposure. This also necessitates tipping the head back, raising the chin point, and hence altering the desired plane, with resultant distortion of the image. In the pyknotic young adult it was sometimes impossible to get a truly good result, regardless of how the patient was placed in the apparatus.

The films were of generally good quality, but they were not as clear as the intraoral films. Gross decay is readily seen but smaller lesions, which are clearly seen on bitewing films, are hazy. In its present form, the Panorex will not replace standard dental x-ray techniques. A single image of the entire mandible, maxilla, sinuses, and temporomandibular joint gives a much more comprehensive picture of the lower face than separate full-mouth films. For the diagnosis of tumors and fractures and for orthodontic and general records, the Panorex has a place in the dental armamentarium. The advantage of seeing oral structures without superimposition of skull anatomy is a distinct advantage.

* * * * * *

Personnel and Proffessional Notes

Dental Officers Present Clinic in Philadelphia. The 1964 Greater Philadelphia Meeting of the Philadelphia County Dental Society was held on 1 to 4 March. CAPT Wendell Naish, DC, USN, FOURTH Naval District Dental Officer, moderated a comprehensive clinic presented by Dental Officers of the U. S. Naval Dental Clinic and U. S. Naval Hospital, Philadelphia.

Clinicians and their presentations were as follows:

CAPT J. F. Keenan, DC, USN Head, Periodontics Dept., NDC	Periodontal Considerations for Removable Partial Dentures
CAPT A. B. Costa, DC, USN Head, Preventive Dentistry Dept., NDC	Practical Concepts of Operative Procedures
CAPT E. N. Gardner, DC, USN Head, Prosthodontics Dept., NDC	Preparation for Removable Partial Dentures
CAPT E. R. Bernhausen, DC, USN Chief of Dental Service, NavHosp	Delivery Phase of Removable Partial Dentures

CAPT K. A. Traeger, DC, USN
Head, Oral Surgery Section,
NavHosp

Reduction of Trauma in Transition to the Edentulous Mouth

Joint Scientific Meeting at NavHosp Philadelphia. CAPT Wendell Naish, DC, USN, FOURTH Naval District Dental Officer, hosted the Fifteenth Annual Joint Scientific Meeting of the Philadelphia County Dental Society, with the U. S. Naval Dental Officers of Philadelphia. The meeting was held on 8 April 1964, at the U. S. Naval Hospital.

The highlight of the meeting was a presentation by CAPT Gordon H. Rovelstad, DC, USN, entitled, "Current Concepts of Preventive Dentistry." Capt Rovelstad is on the staff of the U. S. Naval Dental School, NNMC, Bethesda, Maryland, and is a Diplomate of the American Board of Pedodontics.

Navy Dental Officer Presentations. CAPT S. T. Kasper, DC, USN, Commanding Officer, U. S. Naval Dental Clinic, Brooklyn, N. Y., presented an illustrated lecture entitled, "The Neuromuscular Theory of Centric Relation," before the Second District Dental Society of New York, on 27 February 1964, in New York City.

LCDR Noel D. Wilkie, DC, USN, of the Naval Air Facility, Naha, Okinawa, presented a lecture with slides on "Preventive Dentistry," before the Naval Officers' Wives Club of Okinawa, on 20 February 1964, during their monthly meeting.

CAPT Frank J. Kratochvil, DC, USN, of the Naval Dental School, Bethesda, Maryland, presented an essay and panel discussion on the subject, "Teamwork Between Doctor and Prosthetic Technician," before the District of Columbia Dental Society, on 11 March 1964, in Washington, D. C.

CAPT Kratochvil also presented an essay with slides on "Planned Partial Denture Treatment," before the Valley District Dental Society, on 1 April 1964, in Holyoke, Massachusetts.

Naval Examining Board Selects Candidates for Appointment to Dental Corps. The Naval Examining Board convened in the Dental Division, Bureau of Medicine and Surgery, on 25 February 1964, and selected the following candidates for appointment in the Dental Corps of the U. S. Navy.

LIEUTENANT COMMANDER

DIEM, Charles R.
GOSKA, John R.
KRAUSE, James E.
REED, Wilbur G.
WALSH, John D.

LIEUTENANT

ABEYTA, Edward L.
ASHCRAFT, Ray A.
BAKER, Terrace W.
BOLLINGER, Thomas E.
CARROLL, Peter B.
COLEMAN, Robert Y.

COPELAND, Richard A.
CUNNINGHAM, Peter R.
DEBS, John F.
DeMEYER, John H.
EBERT, Walter H.
EISENBURGER, Michael M.
FJERSTAD, James H.
GIROLAMI, John J.
HABIG, Louis C.
HEGET, Harry S., Jr.
HIRSCHFELD, William E.
HUELSTER, Peter C.
JONES, Robert S.
KASENCHAK, Peter (n)
LABLE, Eliot (n)
LODICO, Richard S.
MAGERS, Stephen
MANGUM, Frank I.
McCAGHREN, Allen D.
MOFFETT, Robert P.
MUIR, Theodore E.
NEGUS, Charles F.
NELSON, Ronald T.
NICHOLS, Gary P.
PEDRICK, George R.
PIERCE, Gerald L.
PILLE, Joseph G.
POE, Gerald S.
PYLAND, Albert B.
RICHARDSON, William G.
RUSSELL, Harold L.
SIEGAL, Donald E.
SIRACUSE, Joseph T.
TABA, Seikichi
VAN SLOOTEN, Ronald H.
WINGARD, Charles E.
WOODSMALL, James T.
ZINGHEIM, William F.

Revised Dental Technician Repair Manual Now Available. Dental Technician, Repair (NAVPERS 10687-B) is available through the various Forms and Publications Supply distribution points in accordance with the procedures described by NavSandA Publication 2002 (Navy Stock List of Forms and Publications). Initial distribution is now in progress.

This third edition will serve as a reference text for study, as well as a guide for installation, maintenance, and repair of dental equipment. It has been revised in page size, and the number of chapters has been reduced from 18 to 6 by incorporating all equipment of the same type within a single chapter. Certain portions of the previous edition have been revised for inclusion in this edition; and descriptions of several new items of equipment have been added, together with repair procedures for those items.

List of Newly Standardized Items Available for Issue

FSN	NOMENCLATURE	UNIT	PRICE
L4940-865-1733	Blast Cleaning Cabinet, Dental Laboratory, Bench Mounted	EA	134.00
L6505-023-4259	Sodium Fluoride Tablets, 2.21 mg. (1/30 gr.) 1000's	BT	4.10
L6510-559-3210	Gauze, Absorbent, Iodoform Impregnated, 2 inches by 5 yards	JR	.46
L6520-889-6567	Floss Unwaxed, Dental, 200 yards	SP	.95
L6520-889-9566	Resin Acrylic Dental Impression Tray Material, 1 lb	PG	3.00
L6520-890-1463	Mixer-Investor, Vacuum, Dental, 350 Gm. Capacity, 110 volt, 60 cycle, AC	EA	268.00
L6520-890-1679	Tray, Alloy Accessory, Dental, Plastic	EA	2.50
L6520-890-1680	Dispenser, Silver Alloy Pellet, Dental, Plastic	EA	5.00
L6850-889-7494	Wetting Agent, 4 oz	BT	.46

AVIATION MEDICINE DIVISION

Special Notice

The 35th Annual Scientific Meeting of the Aerospace Medical Association will be held at the Americana Hotel - Bal Harbour, Miami Beach, Florida, May 11 to 14, 1964.

A Naval Aviation Medicine Luncheon is scheduled for Monday, 11 May. This will be the First Navy Luncheon at the annual meeting and it is hoped there will be a large and enthusiastic turnout. Attendees may expect to hear the VIPs and eat well.

All Navy flight surgeons, physiologists, psychologists, flight nurses and friends are cordially invited to attend.

Since this event comes early in the program on the first day of the meeting, attendees are urged to Register In Advance for the luncheon. Advance registrations should be sent to:

Aerospace Medical Association
Washington National Airport
Washington, D. C. 20001

Tickets for the luncheon will also be on sale at the Registration Desk beginning Sunday afternoon, 10 May.

Recommended Uniform

a. For the general meeting, Service Dress Khaki with blouse.

b. For attending the banquet, Dinner Dress, White Jacket, with miniature medals and gloves is preferred. The Service Dress White uniform with ribbons may also be worn.

c. Civilian clothes are permissible during attendance at the regular sessions, if desired. However, it is encouraged that all Navy personnel wear their uniforms at least the first day so that they will recognize one another, and others will recognize them as Naval officers.

—Aviation Medicine Division, BUMED

A Letter from the President of the Aerospace Medical Association

If you have not already sent your advance registration and made your room reservations at the Americana Hotel for our 35th Annual Scientific Meeting, May 11 to 14, 1964, we urge you to do so at once. Early response from previous announcements has been excellent.

Through the Journal you have received information on the many special features of the scientific program and other events scheduled. This year's

meeting will be one of the most outstanding in our organization's history. I hope you are planning to attend. Take a look at a brief summary:

The scientific papers cover a wide range of subjects and, with three simultaneous sessions, you are assured of outstanding presentations and discussions in your special field. A detailed program was published in the February AEROSPACE MEDICINE.

Color TV will be used during 3 sessions; (1) "Clinical Aerospace Medicine"; (2) "Civil Aviation Medicine"; and (3) "Medical Support - Gemini".

The internationally renowned scientist, Dr. Carl-Johan Clemedson, of Sweden, as the annual Louis H. Bauer Lecturer, will present "Integrative Research and Aerospace Medicine" as the keynote address opening the scientific program. Other eminent scientists, whose exploits in aviation and space exploration are well known to us, will participate, and still others will be honored by the Association.

Clinical aviation and space medical information on every type of flight -- the private flyer, the commercial pilot and passenger, the military crewman, the space astronaut -- will receive full attention.

The Exhibits will be greater in number and more exciting than ever before.

A special panel presentation on "Aerospace Medicine and Bioengineering: A Test Pilot's Viewpoint" will be jointly sponsored with the Society of Experimental Test Pilots.

We hope these bits of information will remind you of the benefits to be derived from your attendance at this convention held annually by the Association. A great deal of time, work, money and the personal efforts of many men and women are providing you with one of the finest professional meetings to be held this year.

Cordially,

S/Charles I. Barron, M.D.
President

Baseline Electrocardiogram

BUMED Instruction 6120.15 requires all student and designated naval aviators to have a baseline electrocardiogram permanently filed in their personal health record.

It has come to the attention of the Bureau of Medicine and Surgery that these electrocardiograms are not present in many health records. Investigation has revealed some instances where the baseline electrocardiogram has never been obtained and other instances where the electrocardiogram has been removed from a health record for unknown reasons.

The importance of a baseline electrocardiogram and its retention in the individuals health record can not be over emphasized.

To reacquaint all flight surgeons with the requirement of the baseline

electrocardiograms, a portion of the advance change in the Manual of the Medical Department, that will incorporate BUMEDINST 6120.15 into the Manual, is reproduced as follows:

> All student and designated naval aviators on active duty shall have an electrocardiogram on file in their Navy Health Record. Those who do not have one, shall be given one at the time of the next flight physical examination regardless of the purpose of the examination. The baseline electrocardiogram shall be marked, "Not to be removed from Health Record" and will be retained in the individual's health record until the record is permanently terminated. A representative sample (or copy) of the electrocardiogram properly identified as to full name, rank, serial number and date shall be forwarded to the Naval Aviation Medical Center, Pensacola, Florida 32512.
>
> —Submitted by Aviation Medicine Division, BUMED, at the request of C.O., U.S. Naval School AvMed, NAMC, Pensacola, Florida.

The Role of the Flight Surgeon*

by

F/L PF Kelly

(Article in Aeromedical Reports 1964, Institute of Aviation Medicine, Royal Canadian Air Force).

This short essay is in no way a comprehensive coverage of the subject, but with some experience and considerable interest in the field, this may be a good opportunity to present some of my views concerning the role of the Flight Surgeon in RCAF service. It must be stressed that the following (in my opinion, that is) represents the very basis of the successful practice of aviation medicine without which all the courses in Christendom are of little avail.

The Man Himself

I know it appears manifestly obvious but I would like to state that the most elementary essentials for the Flight Surgeon are both an interest in medicine and an interest in aviation. Inseparable from these and just as elementary and essential is an interest in people as people, all three interests forming a healthy root without which no aspirant can hope to flower to the successful clinical practice of aviation medicine. No emphasis is too strong to apply here. Further conditioning is necessary by being oriented to the service because we ourselves are doctors in that service, working with aircrew members of the RCAF. Without any of these interests: medicine, aviation, people,

---

* Re-publication of this article in the U.S. Navy Medical News Letter has been authorized by the office of the Staff Medical Officer (Air), Canadian Joint Staff, Washington, D. C.

and the RCAF, bare competence is the maximum possible achievement, but real proficiency is unattainable.

Not only must this be genuine but it must be manifestly seen to be genuine; any half-hearted interest or concealed disinterest is very soon detected by aircrew. From then on, that Flight Surgeon has failed; he has destroyed his chances of ever being really efficient because he has lost that essential key to his profession, the confidence of his "patients". "But this applies to any other medical man to some degree", you say. True, but in few other practices is this so vital as in the practice of aviation medicine in the squadrons.

Usually there is only Flight Surgeon to see, and if he is not in receipt of their confidence the aircrew will stay away as much as possible, thus nullifying his talents. And these are the men who are constantly at risk, really deep down inside aware of it, and utterly needing a man they can trust and confide in; one who understands and appreciates their problems, with understanding and appreciation based on proven, professional, medical and aviation knowledge tempered by service awareness, and with a human application. In no other branch of medical practice is this quite so vital. It is as if the whole of a doctor's practice was constantly exposed to a fatal infection, and having to perform an essential job at the same time, with him as the only doctor possible. The deeper implications of this will become apparent later in the discussion when we go into the job itself.

Meanwhile I would like to say a few words about the personality of the Flight Surgeon, and straightaway point out that, providing the aforementioned interests are maintained, there is no reason why any particular personality type should not be a successful doctor in aviation medicine. However, because of its very nature certain types will have an advantage; the easy mixer, the social drinker, the sportsman, etc; which qualities complement the basic attributes and facilitate good practice for reasons which we shall see.

The Medicine and the Aviation

Essentially the work is a very specialized general practice, with the large share of routine general, medical, surgical, psychosomatic, and common human problems found in all general practices but with the unique difference that all the "patients" are highly trained aviators performing an essential job in a particular service, the RCAF. It is due to this that the specialty training arises, because aircrew are indeed a very select group of individuals living in a particular environment; the two interacting with normal pathological processes to produce a definite field of medical practice. This latter is at perhaps its most rewarding and demanding and certainly most interesting level in an operational flying unit.

Given the essentials described, how does the squadron Flight Surgeon utilize these to produce a good practice? What must he strive for to realize this? I think the answer can be summed up in two words - respect and confidence. It is so necessary for the Flight Surgeon to be quite competent in

all aspects of general medicine and well able to solve such problems in a correct manner where they impinge on service or aviation problems. Here, of course, the aircrew (members) expect complete understanding, ready knowledge and sound judgement; the latter, especially, being decisive in establishing such relations with the aircrew that their respect and confidence are readily won. Decisions explained to them in a way they can easily understand, and seen to be sound clinical aviation medicine; the impression that you are for them and not against them; a human commonsense approach; these are factors which enable your aircrew to realize your interest and ability and that you are not out to treat them as just so many cases. This is most important. Again, ready willingness to actually fly as frequently as possible is a factor which I personally have found to be of not inconsiderable value in gaining aircrew confidence on a flying station.

Demonstrated ability and obvious interest quickly produce a climate of respect for and confidence in the Flight Surgeon, but his professional qualities should ideally be augmented by his personality. This, after all, is how most of the aviators will first meet their Flight Surgeon (although a good idea is for any new Flight Surgeon on appointment to a squadron to go and make himself known officially), and this is how his practice greatly differs from civilian life; the Flight Surgeon lives in close contact with his aircrew, readily and unavoidably mixing with them every day and whilst it for the most part conveys decided advantages, this arrangement also has a small difficulty in that the attitude of the doctor is rather more difficult to correctly define. Whilst a definite "one of the family" brotherhood is necessary, and indeed to be encouraged, on occasions it may be necessary to subtly reveal a definite "doctor/patient relationship". However, familiarity can breed respect!

Having successfully gained the confidence and respect of the aircrew, the Flight Surgeon is now in a position to definitely influence the performance of the squadron, especially its morale, and to proceed with the numerous other related jobs incumbent upon his office; crash facilities supervised; alert hangers inspected; the standard of food services kept up; flying schedules watched; briefings attended, and all the other small things whereby the Flight Surgeon keeps his ear to the ground and knows everyone on the station, but has his finger on the pulse of the squadrons.

The Aviators

This particular select group of individuals does indeed have its unique characteristics from the point of view of a group practice. Aircrew are trained to make decisions, to control fear, to be opinionated, to be right; they must have ego, they are intelligent; all these things producing a very special practice with its own special problems. To become proficient at his job the Flight Surgeon must gain his objectives as previously discussed and this involves knowing the individual aviator at work, at home and at play. This is achieved by being around the flight line, around the squadron, around the bar, and even around to dinner at the appropriate times. Such "eyes and

ears open" progression through professional and social occasions invariably pays dividends by the acquisition of a great fund of information; the squadron CO and his problems, his flight commanders, the unusual type in the squadron; their missions, their disappointments, their hopes, their grumbles, etc. Beyond this a little behind-the-scenes research can fill any gaps in your knowledge. The Flight Surgeon should be fully in the picture.

Might I suggest to you, gentlemen, that if these principles are followed in the practice of aviation medicine in the squadron, then we will achieve its proper fulfillment: a man known, liked, and competent, on top of his job and able to go to any flying station in the RCAF and be greeted by that pleasant informal phrase, "Hi Doc, what'll you have?"

* * * * * *

Commander Walter L. Goldenrath, MSC, USN Receives Award

Commander Walter L. Goldenrath, Officer-in-Charge of the Aviation Physiology Training Unit at the U. S. Naval Air Station, North Island, San Diego, California recently received an Honorary Life Membership to the Space and Flight Equipment (SAFE) Association. The award cited Commander Goldenrath's endeavors on the development of the Navy's Full Pressure Suit and for outstanding contributions in the field of space and flight equipment.

The certificate was presented to Commander Goldenrath by Mr. Richard Wolf, President of SAFE. Real Admiral J. D. Arnold, Force Materiel Officer for COMNAVAIRPAC, presided at the ceremony.

Only two such awards are given out each year in the United States.

* * * * * *

Symposium Attacks Problems of Human Performance in Low-Altitude, High-Speed Flights

The critical problems faced by pilots flying low-altitude, high-speed missions as a means of avoiding radar detection was the subject of a three-day symposium in Anaheim, California, March 3 to 5. The symposium, jointly sponsored by the Office of Naval Research and the Autonetics Division of North American Aviation, brought together psychologists, aviators and other scientists representing the Navy, Air Force, Army and industry, who will initiate a coordinated effort to provide solutions to the problems.

All three services are concerned with low-altitude, high-speed missions because recent advances in radar defense systems have made it imperative that aircraft avoid early detection to insure survival. Missions which require flying at extremely low altitudes include visual reconnaissance, ground support, or fire control. These missions require the pilot to be constantly and fully alert since their success depends on the precise location of ground points. Such navigation is a combination of dead reckoning and visual and radar navigation.

Evidence is accumulating which shows that pilots sometimes get lost and confused, a phenomenon known as geographic disorientation, while traveling for extended periods at great speeds at altitudes of less than 100 feet. Light Army planes travel at slower speeds but at even lower altitudes. In addition to the demands normally made on the pilot, there is the further strain due to the vibration and buffeting of the aircraft created by gusts of ground winds and other factors present when skimming close to the ground. Geographic disorientation not only affects military pilots but is also a serious problem in civilian aviation, with at least 235 accidents occurring in civilian flights during the past three years due to this phenomenon.

Vibration during low altitude flights not only makes the aircraft difficult to control but may also interfere with instrument reading. Terrain avoidance radar and other airborne display systems are being developed to aid the pilot in such missions. However, since the constant alertness of the pilot is a key factor, the principal objective of this symposium was to plan approaches which will result in easing the burden imposed upon him in such flights and thus assure the successful completion of military missions.

The Psychological Sciences Division of the Office of Naval Research has under consideration a research proposal from Autonetics concerned with dynamic visual acuity, which refers to the ability to locate and identify objects or targets moving in the visual field. This study would be the first systematic investigation of visual acuity while the target is moving toward the observer at various angular velocities in different parts of the visual field. An ONR-supported research program which has been conducted by Boeing Aircraft since 1959 is studying in the laboratory the effects of vibration upon human performance, such as those encountered during the operation of aircraft at low-altitudes as well as of hydrofoils.

* * * * * *

Medical Service Corps Scientists Serve Fleet Task Group

In April 1962 a unique working relationship was established by the Bureau of Naval Weapons between a fleet operating force and a group of scientists working out of the Bureau of Medicine and Surgery and the U. S. Naval School of Aviation Medicine. Recognizing the fact that the maximal application of current weapons systems developed by the Bureau of Naval Weapons is dependent upon the continued availability, to the local commanders, of performance data of the system and crew personnel alike, it was determined that such information should be obtained most expeditiously. This was effected by the assignment of a part-time Scientific Advisory Team to a fleet operating force, as an ancillary group, to provide scientific statistical assistance and to conduct required operational observations that would save time for the crew members as they performed their tasks.

In view of the special mission of the operating force, and with their concurrence, the necessary financial support was made available by the

Bureau of Naval Weapons to make the services of scientific personnel available on a systematic basis. Along with the local flight surgeon, the Scientific Advisory Team was requested to study airborne personnel performance, assist in data processing, establish acceptable scientific criteria, and make recommendations on selection and training of airborne personnel.

After preliminary study, it was determined that there were several major areas of research interest. Since that time, the Scientific Advisory Team has collected data which describe the detailed functioning of a single patrol aircraft in action against a potential target. These detailed descriptive statistics constitute a beginning of an extensive and systematic operational library of technical and performance data. Libraries of this kind have been recognized as a necessary requirement for solution of many problems. The first major task of the Scientific Advisory Team was to develop the required data processing codes capable of reducing the station-to-station records to a numerical format, and which, in turn, allow for rapid summarization, correlational analysis, and statistical prediction. Last year it became necessary to establish one full-time billet with one of the air wings to provide the required continuity to the research and fleet observational efforts being generated by the other members of the Scientific Advisory Team. LCDR Allen E. McMichael, MSC, USN, Deputy Head, Scientific Advisory Team, was picked for this assignment.

The establishment of a performance data retrieval system to supply the needs for continual updating of libraries led to the exploration of the possibility for the adaptation of the principles of such a system to other types of forces. The basic performance data retrieval system provided a means for establishing certain baseline data concerning performance and efficiency at the fleet operating level. With these data available, other questions relative to the effects of aircrew turnover and its effect upon efficiency in the prosecution of particular kinds of tactics became a reality. Both airborne observation and automatic data retrieval methods now are being utilized. In addition, new parameters involving oceanographic variables are being studied.

The utilization of these data in relation to the improvement of training methods and techniques is considered to be of primary importance in relation to the question of flexibility required by a fleet command in order to meet changing requirements for tactics and defense.

Flexibility is required to meet fleet requirements and the membership of the Scientific Advisory Team changes as the priority of the operational requirements change. At the present time the team is headed by CAPT William F. Madden, MSC, USN, Head, Research Psychology Branch, Bureau of Medicine and Surgery; LCDR Allen E. McMichael, MSC, USN, Deputy Head and data systems specialist. Other specialists include: CDR William H. Nelson, MSC, USN, Naval Medical Research Institute, LTJG John C. Ferguson, MSC, USNR, Aviation Medical Acceleration Laboratory, who is representing the Naval Air Development Center, Johnsville, Pennsylvania, and ENS Charles J. Theisen Jr., MSC, USN, Staff, Naval Air Advanced Training Command, Corpus Christi, Texas. Other specialists who have served with

the Scientific Advisory Team on special projects have been Robert T. Camp, U. S. Naval School of Aviation Medicine, Pensacola, Florida; LTJG Lawrence E. Hardacre, MSC, USN, currently stationed at the U. S. Navy Medical Neuropsychiatric Research Unit, San Diego, California; LT Jimmie H. Johnson, MSC, USN, DUINS, University of Miami; and LT Richard Schoenberger, MSC, USNR, now a civilian scientist stationed at Wright Patterson Air Force Base, Dayton, Ohio.

* * * * * *

Do the Eyes Have It?

In medicine, we have been trained to be as objective as possible. True, we are cognizant of the subjective. In many areas of medical history and physical examination, we accept certain amounts of subjectivity for it may be our only yardstick. This has been true in certain portions of the eye examination. Particularly, in connection with phorometry and, even with the Snellen Chart, this is so. It is well known that many flight applicants, as well as other examinees, have been coached to pass the eye examination. While it is testimony to their desire to get into a particular program, be it Naval Aviation or the Naval Academy, it behooves the medical officer to determine in every case whether or not a man actually sees what he states he sees.

The opposite is also true. The eye and its supporting physiological and anatomical appendages may be adversely affected by fatigue, eye strain, and injudicious celebrations the night before—to mention but a few. It is then advisable to give the individual enough time to put his visual apparatus back into the state of "normalcy" prior to examination.

As phoria examinations are subjective, it is often necessary to have additional information to validate these results. The procedures described below work very satisfactorily. Some of them are objective and involve harmless but justifiable trickery. Needless to say, phorias should be measured before prism divergence and convergence as the extra ocular muscles fatigue easily during these examinations and will make phoria measurements variable. When, for any reason, the phoria values are questionable in the eyes of the examiner, one or more of the following will be of value in arriving at the truth.

1. Switch the Maddox Rod to the opposite eye. Then, noting the esophoria or exophoria value from the first examination, set this value on the Risley Rotary Prism before swinging it in front of the eye. Then, very slowly turn the prism knob. Have the patient state when the light and line separate. Very small amounts of rotation will move the light away from the line normally. If, in these cases, an individual has learned to estimate when the line and light touch (by roughly knowing the distance between the light and line as he sees them), small amounts of movement of the Risley Rotary Prism will not be detected as motion of the light. Two to four diopter variations will be often reported as "no motion" or "they are still lined up." This is impossible.

2. Knowing the esophoria or exophoria value, set the Risley Rotary Prism 1 diopter away from the true value and swing the prism before the eye. The Maddox Rod is before the other eye. Turn the Risley knob so as to rotate the prism across the neutral point to 1 diopter the other side. Repeat this fairly rapidly. This should be reported by the subject as movement of the light to "right" then "left" and "right" or vice versa as the case may be. The educated guesser will often be unable to detect this relative movement correctly and will not report it as such.

3. Using simple prisms or the convenient prism bar, neutralize esophoria or exophoria for distance by the cover test. When the correct prism value is in front of the eye, there will be no drifting from fixation point at twenty feet when the eyes are alternately covered. This prism is the true esophoria or exophoria value. This is the one irrefutable objective test for phorias.

4. In determining point of convergence using a muscle light attachment on the ophthalmoscope handle and watching the reflection of the light in the eyes, the earliest lateral drift of one eye can easily be detected.

5. In cases where esophoria is more than 5 diopters or less than 10 diopters, be reluctant to run the red lens test. Preferably, when there is doubt, recheck the phoria daily for the next few days. Incorporate any of the above three procedures as necessary. A red lens test should be run only once on an individual. A second test any time is often invalid because the person may well have learned "what he should see." When doing a red lens test, always determine esophoria or exophoria when diplopia occurs. By recording esophoria or exophoria in the field of action of each muscle, the specific muscle imbalance or paralysis can be determined.

6. Lack of sleep, excessive eye usage, or indulgence in alcohol the night before may affect true phoria values a great deal. The candidates' true eye measurements, whatever they are, is the goal. If the examiner uses all the aids at his disposal and arrives at the correct values, he then has answered the question, "Do the Eyes Have It." (LT J. J. Gordon, MC USN, CVG-2, USN Medical News Letter, 27(12): 39-40, 22 June 1956.)

Reserve Point Credits

Dr. Shirley C. Fisk, Deputy Assistant Secretary of Defense (Health and Medical) of the Department of Defense, has requested the Military Departments to authorize Reserve physicians to earn retirement points at the Aerospace Medical Association's 35th Annual Scientific Meeting, May 11 to 14, 1964, Americana Hotel, Miami Beach, Florida. This covers eligible physicians who are Medical Corps officers of the reserve components of the U. S. Army, Navy and Air Force on inactive status.

* * * * * *

RESERVE SECTION

Qualifications In Submarine Medicine For Inactive Duty Medical Officers

BUPERS INSTRUCTION 5400.42B, enclosure (4), Section 8F, which is available at Reserve Training Centers, promulgates requirements for qualifications in Submarine Medicine for Medical Officers on inactive duty who participate in the Submarine Reserve Program. Prior to publication of this Instruction, Medical Officers became "Qualified in Submarines" and were authorized to wear the coveted medical Dolphins only on active duty. It would appear that this presents a real opportunity for Selected Reserve Medical Officers to qualify and increase their potential to the Submarine Service. Medical Officers who received submarine training, but did not qualify while on active duty, will receive credit towards reserve qualification.

If, after you have read the cited Instruction, you feel that you might become qualified, you may write to the Director, Submarine Medicine Division, BUMED, for additional information.

* * * * * *

Aerospace Medical Association Meeting

Authority has been granted to award retirement points to eligible Naval Reserve Medical Department officers on inactive duty for attendance at the Military Session to be held in conjunction with the 35th Annual Meeting of the Aerospace Medical Association at the Americana Hotel, Miami Beach, Florida during the period 11 to 14 May 1964. One retirement point is authorized each day for attendance at military sessions of at least two hours duration.

Inactive Naval Reserve Medical Department officers are requested to register with the Navy representative present to record and report attendance of eligible officers.

* * * * * *

American Nurses Association

Retirement point credit for Naval Reserve Nurse Corps officers attending the convention of the American Nurses Association, Atlantic City, New Jersey, 15 to 19 June 1964 has been authorized. Eligible Naval Reserve Nurse Corps officers may receive one retirement point per day for attendance at approved training sessions of not less then two hours duration.

Inactive Naval Reserve Nurse Corps officers are requested to register

with the Navy representative present to record and report attendance of eligible officers.

* * * * * *

Federation Of American Societies For Experimental Biology

Authority has been granted to award retirement point credit to eligible Naval Reserve Medical Department officers on inactive duty for attendance at the Military Session to be held in conjunction with the Annual Meeting of the Federation of American Societies for Experimental Biology, at the Conrad Hilton Hotel, Chicago, Illinois during the period 12 to 17 April 1964.

Inactive Naval Reserve Medical Department officers are requested to register with the Navy representative present to record and report attendance of eligible officers.

* * * * * *